



# A Presentation For FUPWG

By

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*“I have over seventeen years experience in the natural gas industry, the last seven with Tenaska Marketing Ventures (TMV). I am responsible for all the hedging and financial trading activities at TMV. My previous natural gas experience has been with KN Gas Marketing, Arkla Energy Marketing, Mississippi River Transmission, Texas Utilities and TXO Production. I have traded gas in Texas, Gulf Coast, Mid-continent, Chicago and Michigan regions. I have a BBA from the University of Oklahoma.”*

# About Tenaska

- **International energy company that develops, owns and operates independent power and cogeneration plants.**
- **Provides natural gas and electric power marketing, trading and risk management.**
- **Active in acquisitions, fuel procurement, and generation asset development.**
- **Privately held**



# Factors Driving Natural Gas Prices

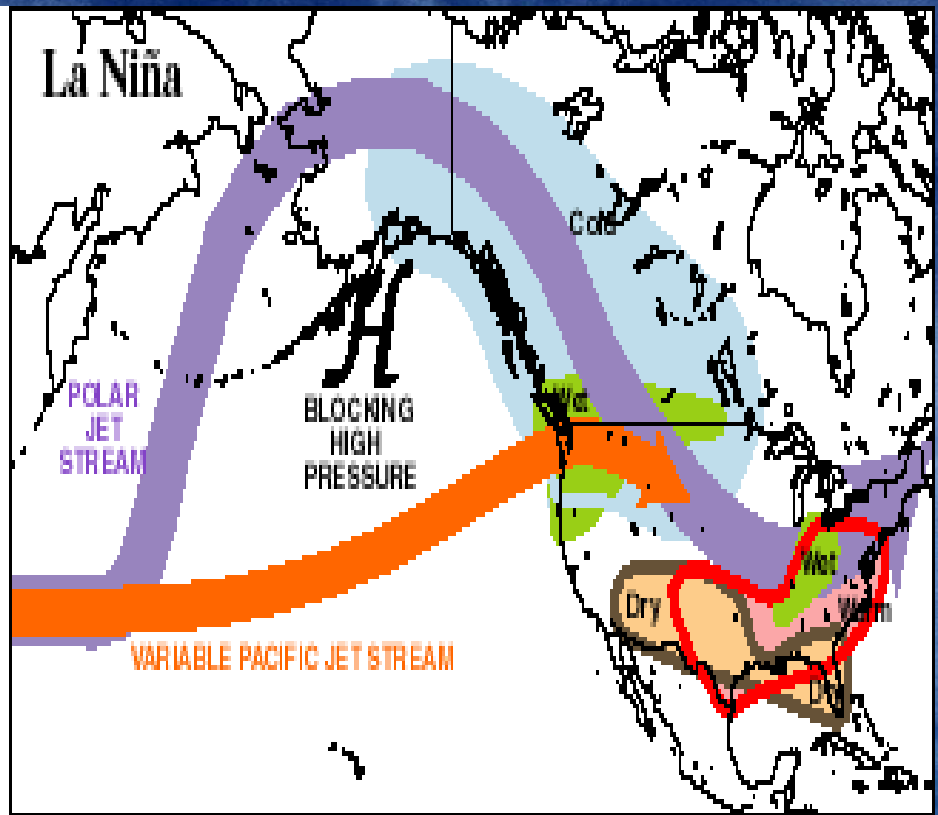
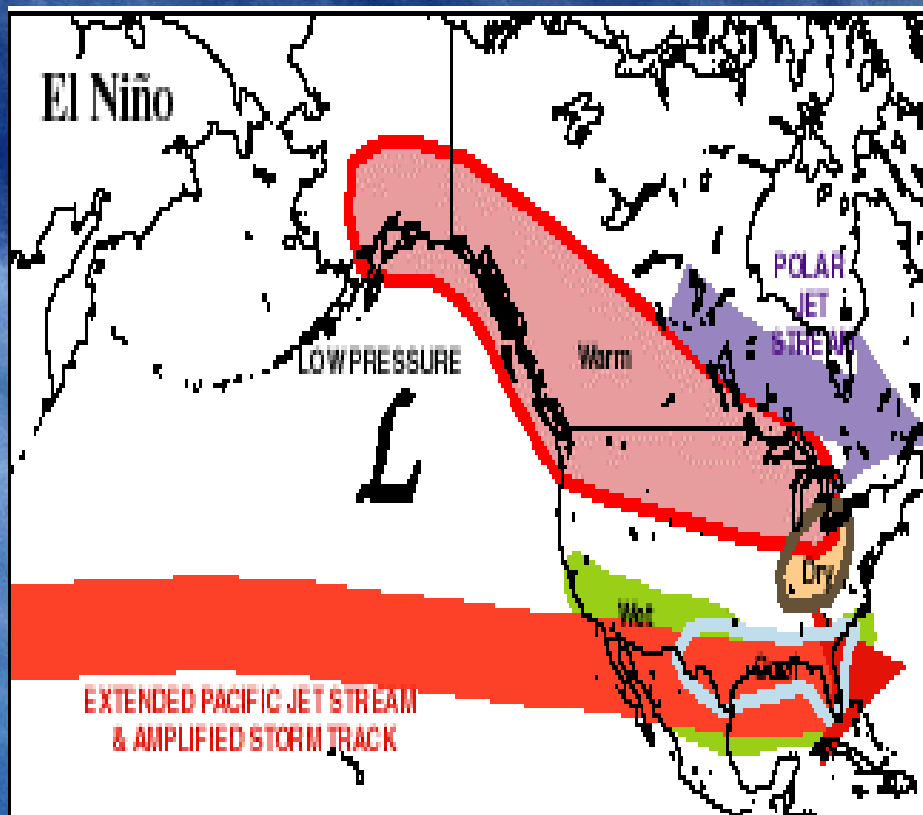
- **Weather**
- **Elasticity of Supply**
  - LNG
  - Pipeline Infrastructure
  - Domestic Production
- **Elasticity of Demand (Economy)**
  - Residential
  - Industrial (Fuel Switching)
  - Electric
- **Hedge Funds (Financial Speculators)**



# **El Nino Continues to Develop**

- **Scientists at NOAA announced that ocean surface temperatures warmed 2 degrees Celsius (4 F) in the eastern equatorial Pacific near the South American coast in February.**
- **El Nino impacts on the United States include:**
  - **A drier-than-normal fall and winter in the Pacific Northwest**
  - **A wetter-than-normal winter in the Gulf Coast states from Louisiana to Florida**
  - **A warmer-than-normal late fall and winter in the northern Great Plains and the upper Midwest**
  - **A suppressed total number of tropical systems in the Atlantic hurricane season**
  - **An increase in the number of East Coast winter storms**

# The Nino's



# **Liquefied Natural Gas Coming to a Terminal Near You?**

- **U.S. LNG imports have dropped significantly since September of last year due to low domestic natural gas prices combined with heightened security concerns after September 11.**
- **Three of the four existing LNG terminals have announced additional expansion plans and several new LNG plants have been proposed.**
- **Expansion plans at the existing LNG facilities are expected to increase U.S. LNG import capacity to roughly 3.5 Bcf/d by the end of next year, while at least 20 new terminals with the potential to bring total U.S. LNG import capacity to about 14.0 Bcf/d by 2010, or nearly 20.0% of currently projected natural gas demand in 2010, are now under consideration.**



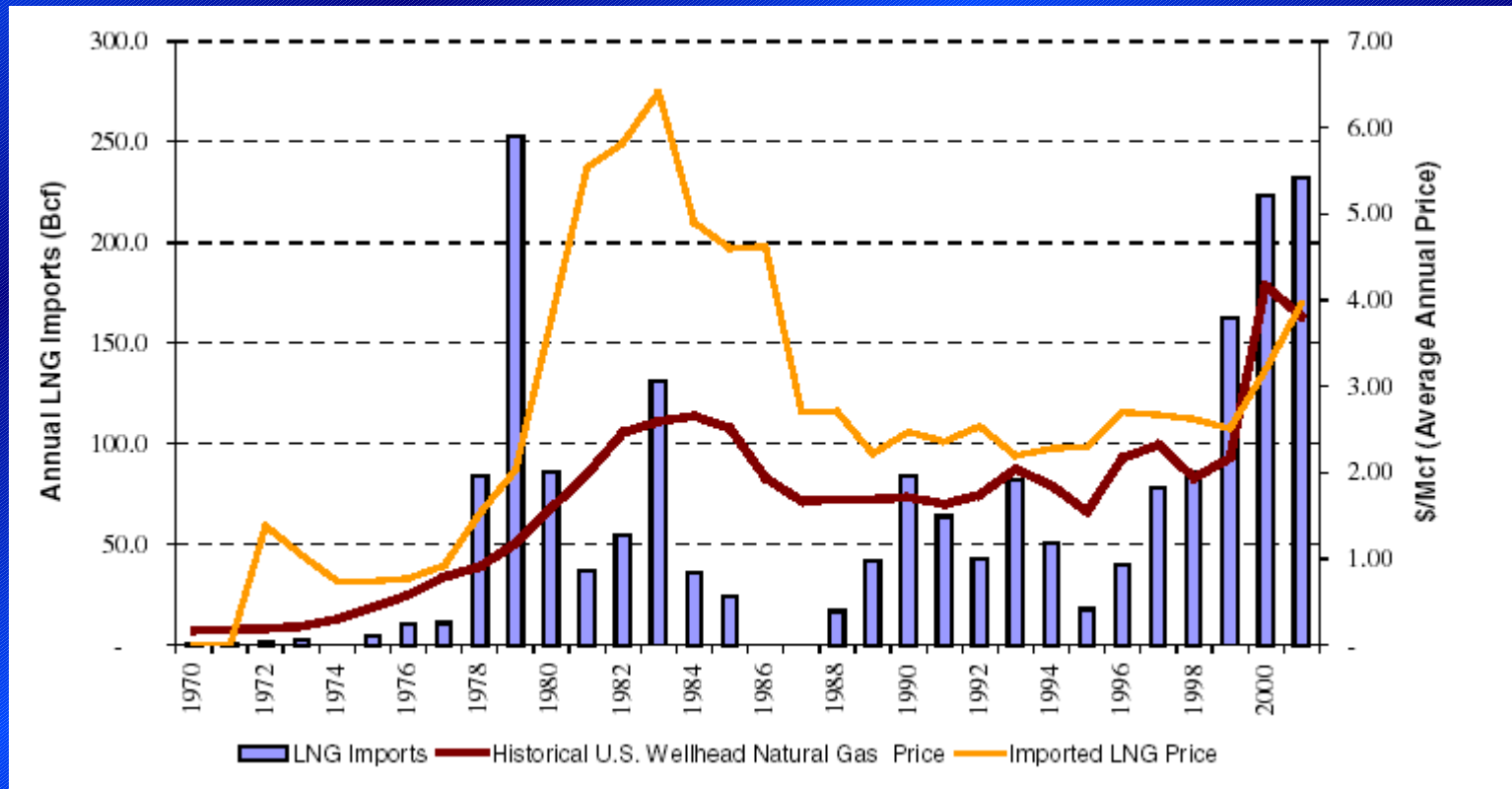
# Existing U.S. LNG Import Terminals

Terminal	Everett, MA	Lake Charles, LA	Elba Island, GA	Cove Point, MD
Operator	Tractebel	CMS Energy	El Paso Corp.	Williams Cos.
Original Startup	1971	1982	1978	1978
Shutdown	1985-1986	1983-1988	1980-2001	Since 1980
Reactivation Date	-	-	Re-opened Q4 2001	Q3 2002
Current Base Regasification Capacity (MMcf/d)	535	630	445	750
'00 Average Volumes (MMcf/d)	271	341	NM	NM
'01 Average Volumes (MMcf/d)	250	390	NM	NM
Expansion Plans	Up to 1,135 Bcf/d by year-end 2002.	Up to 1.2 Bcf/d by year-end 2003. Submitted expansion plans to FERC and expect to receive approval by year-end.	Up to 800 MMcf/d by mid-2005. Plan to submit application for expansion to FERC by Q2 2002. Also plan to add a 3.3 Bcf storage tank to increase storage to 7.3 Bcf.	Adding a 5 <sup>th</sup> storage tank to increase storage capacity to 7.8 Bcf from 5.0 Bcf by 2003; expects to receive FERC approval by June 2002. Currently, no plans to increase regasification capacity.

Source: Salomon Smith Barney



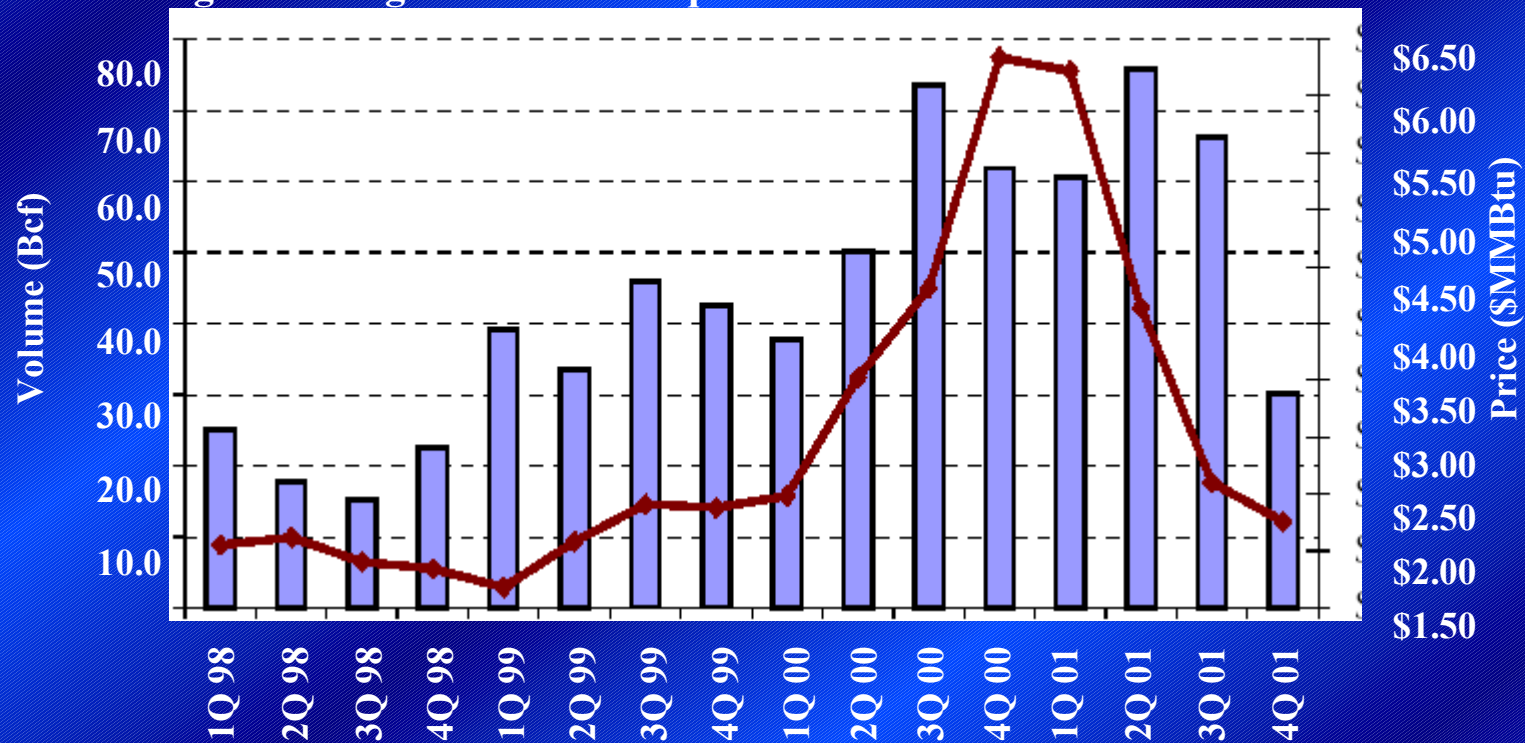
# Historical U.S. Imports of LNG



Source: EIA

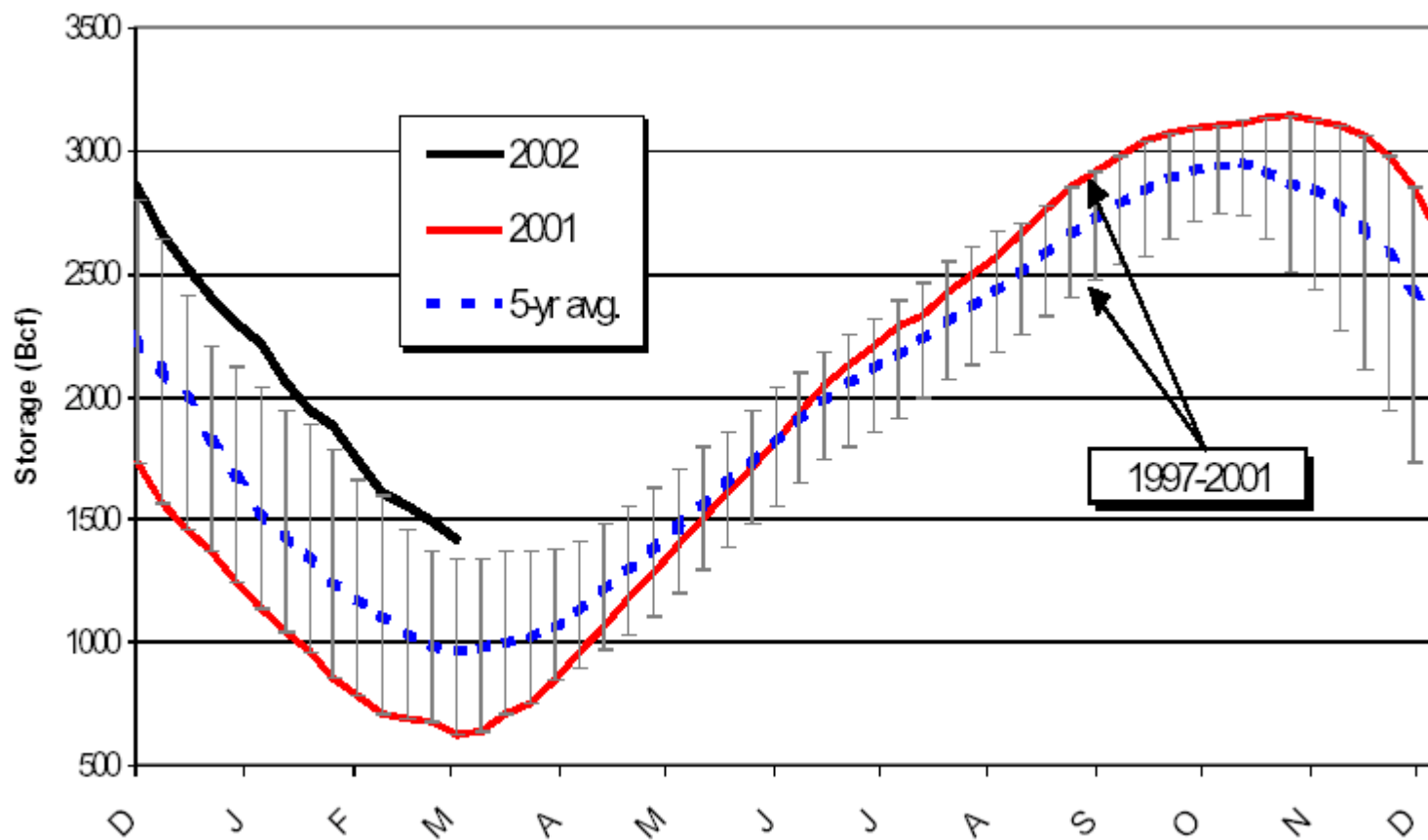
# Total U.S. LNG Imports vs. Composite Spot Natural Gas Price

- The U.S. only received 12 LNG cargoes in the fourth quarter compared with 75 cargoes during the first three quarters of 2001.



Source: Department of Energy-Office of Fossil Energy and Energy Information Administration (EIA)

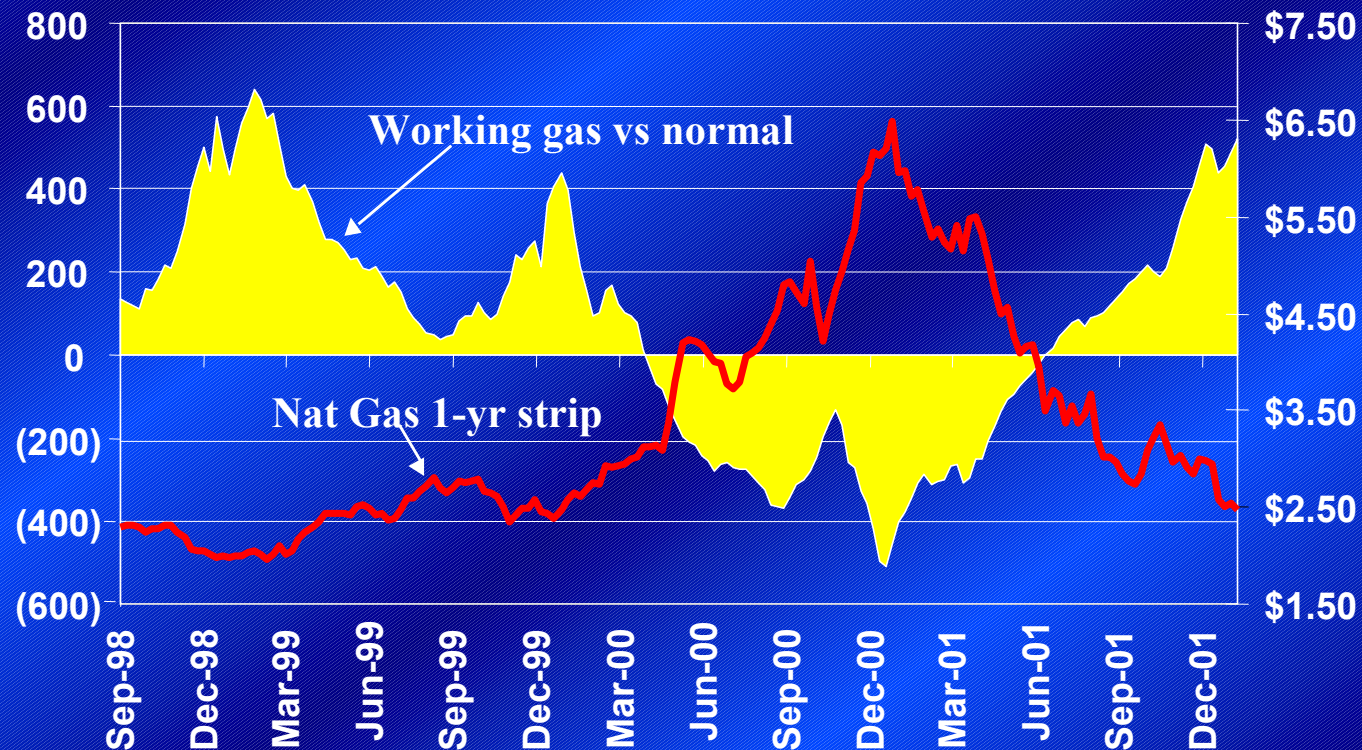
# Working Gas Storage



Source: AGA

# AGA Estimate

- Most market reversals occur when the rates-of-change relative to normal reverse, irrespective of the absolute level of inventory.
- Improving petrochemical demand, poor reserve replacement, inconsistent LNG imports, and positive frac spreads could also be factors contributing to a tightening supply/demand balance relative to degree-days.



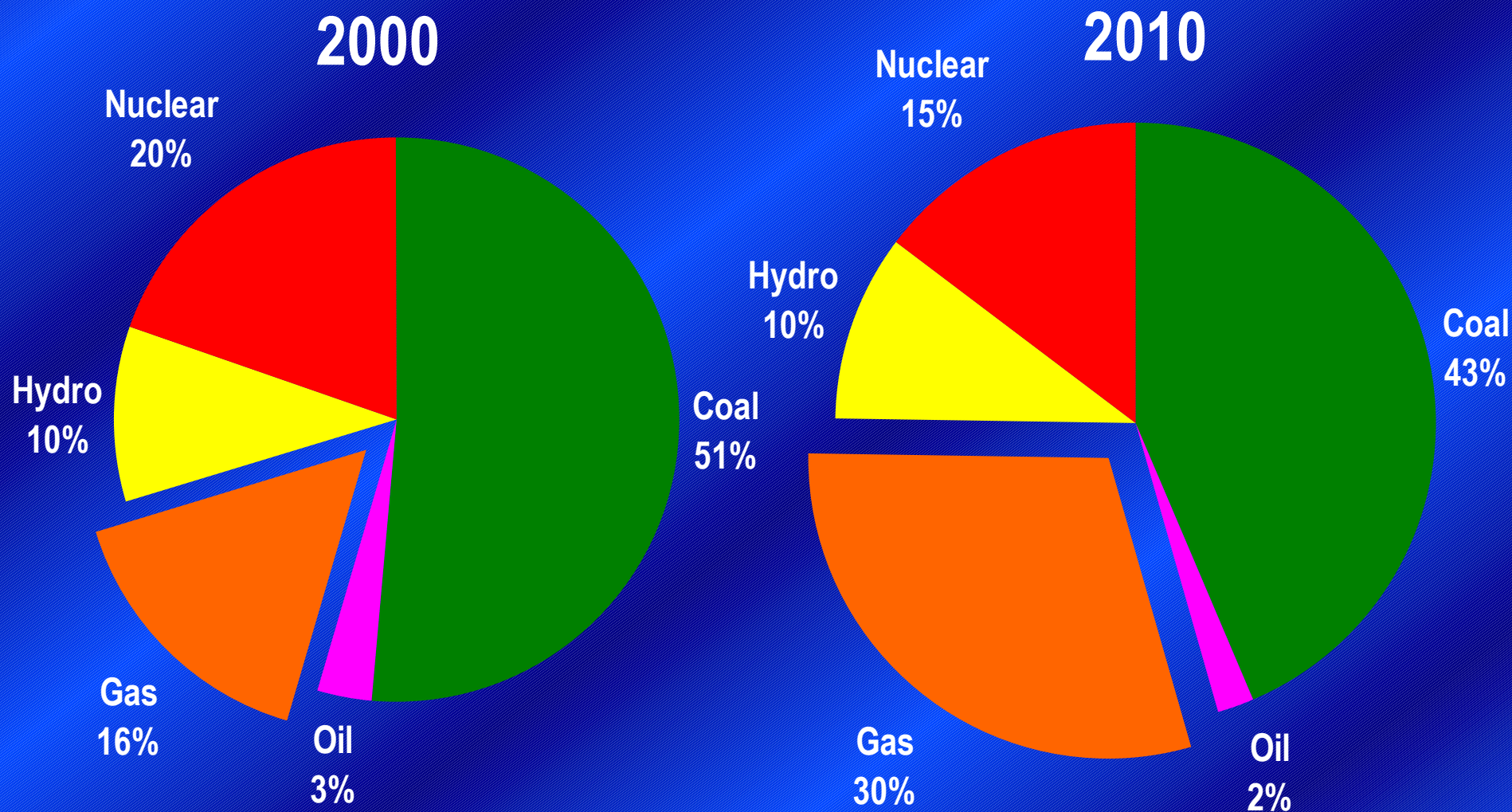
Source: ABN-Amro



# **U.S. Domestic Demand**

- **Estimated 2001 total demand is 22.6 Tcf.**
- **The demand growth is estimated to be at a 3% increase per year.**
- **The increase in demand in 2002 is forecast to come from increased power generation demand and reversal of industrial demand destruction.**
- **Forecasts for total demand of 30 Tcf per year in 2010 is not achievable with current pipeline infrastructure limitations and the overstatement of power demand.**

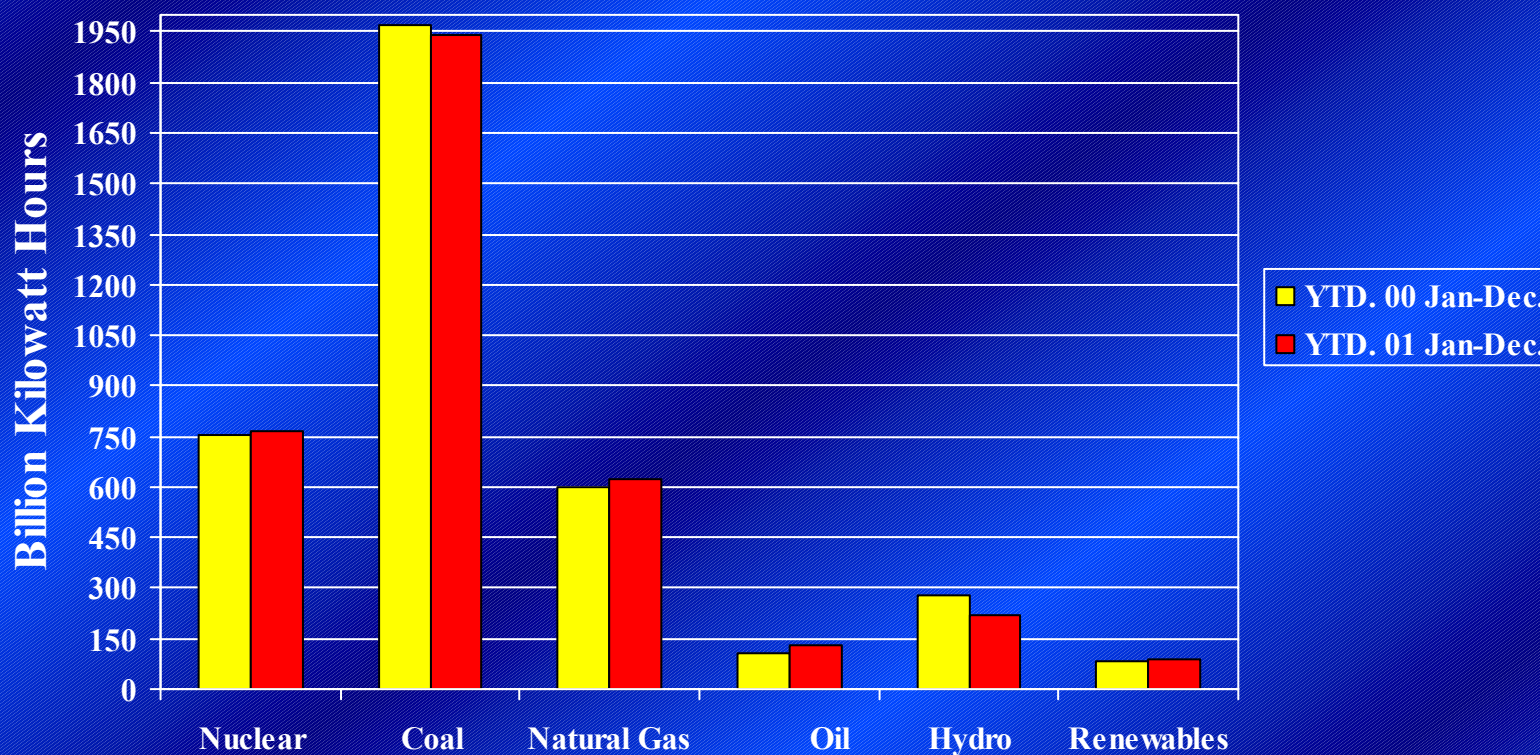
# U.S. Power Generation Fuel Mix



Source: PIRA Energy

# U.S. Electricity Generation

- Coal-fired plants produced (51.6%) followed by nuclear (20.4%), natural gas (16.5%), hydro (5.8%), oil (3.4%), and renewables (2.3%).



# Nuclear Generation

- **Through Dec. 2001, nuclear generation was 1.9% above the record-setting pace of 2000.**
- **Through January 2002, the industry's average net capacity factor reached 98.5%. This figure is 2.1% higher than the same month period in 2001. When compared to the top five nations producing nuclear generated electricity, the U.S.' year-to-date gross capacity factor ranks second, behind Germany's 97.4%.**
- **Through Dec. 2001, U.S. net electricity generation was roughly -.07% lower than the same 12-month period in 2000.**



# **Nuclear Power Plants Set Output Records in 2001**

- **The industry last year authorized to uprate 20 of the nation's 103 reactors, yielding a combined capacity increase of 1,091 megawatts. Upgrades cost as little as \$10 per kilowatt.**
- **Since 1977 industry upgrades have been made at 70 reactors for a combined capacity increase of 3,244 megawatts-the equivalent of approximately one-half of total electric generating capacity in the state of Connecticut.**
- **The nation's 103 nuclear power plants set an electricity production record for the third straight year, increasing their output 1-2 percent to about 762 billion kilowatt-hours (kwh). The plants average capacity factor –a measure of efficiency-reached a record high for the fourth straight year, climbing 1 percent to approximately 91 percent in 2001.**

Source: NEI

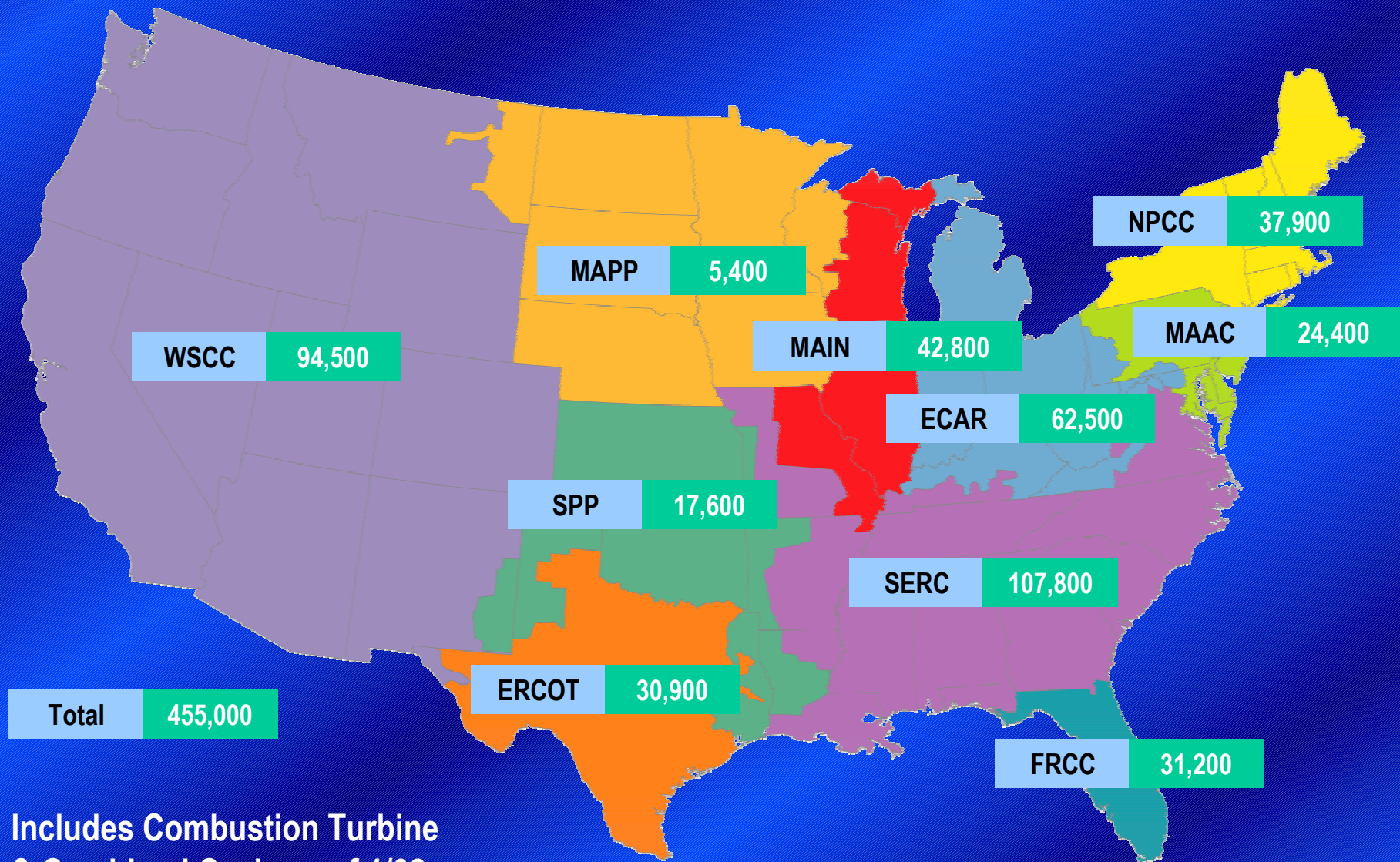


# **Nuclear News**

- **On March 6, the Davis-Besse nuclear power plant discovered damage on the top of the reactor vessel (the reactor vessel head), apparently caused by corrosion from boric acid deposits. A cavity, approximately 4 inches by 5 inches and approximately 6 inches deep, was discovered during a refueling outage.**
- **The NRC issued an information notice to the operators of the 68 other pressurized water reactors (PWR) in the U.S. detailing the findings at Davis-Besse, operated by FirstEnergy Nuclear Operating Company.**
- **FirstEnergy reports that the repair of the reactor vessel head will extend the current outage for approximately two to three months. The company intends to install a new reactor head during the plants next refueling outage in 2004.**
- **The results of the industry survey show none of the 68 PWRs found the corrosion experienced on the vessel head to the Davis-Besse nuclear plant.**

Source: NEI

# Announced Gas-Fired MW



Includes Combustion Turbine  
& Combined Cycle as of 1/02



## **New Electric Generation**

- **It is estimated that each new 100 megawatts (MW) of gas-turbine power generation requires between 8.8 and 11.2 MMcf/d of natural gas to operate.**
- **In 2002, it is estimated that 50,000 MW of new gas-fired capacity will be installed in the United States.**
- **In Michigan, alone, an estimated 3,800 MW of gas-fired power generation plants could come on line in 2002, representing an estimated need for 300-425 MMcf/d in new gas pipeline capacity and supply within the state for this service alone.**

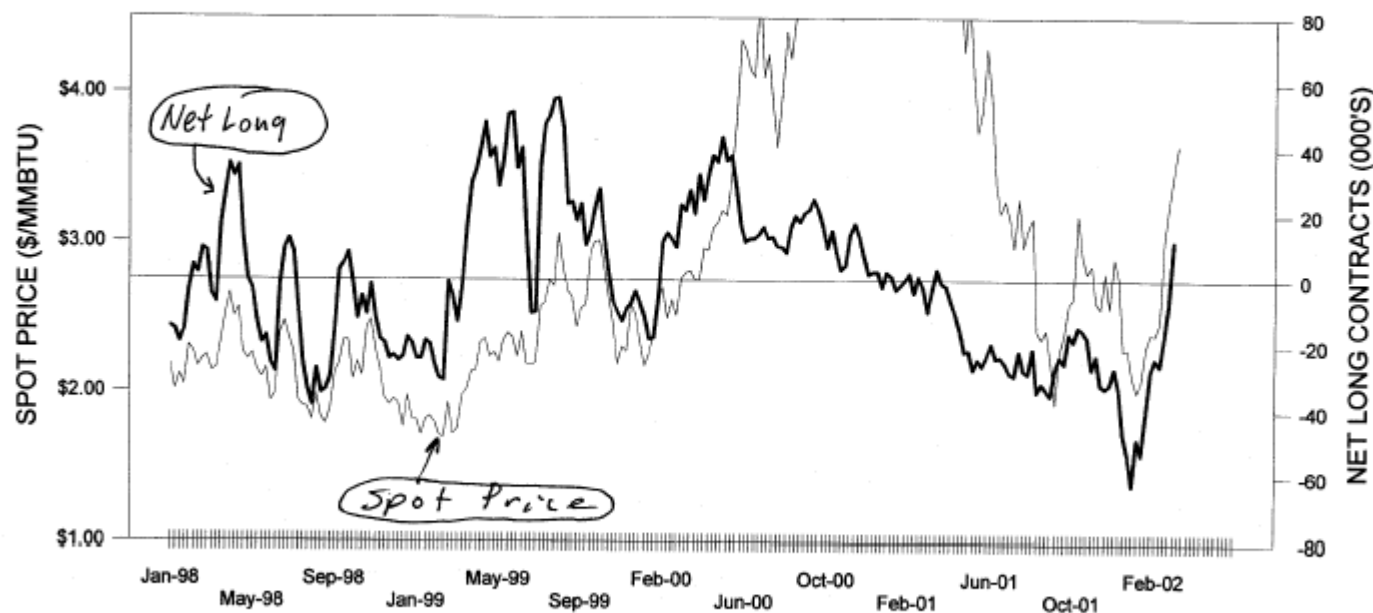


# Paper Market

- **Are Funds Important?**
  - Total capital under management \$75 Billion.
  - Tend to move cycles (believe in the “Trend”).
  - 95% of fund trading is “Technical”.
  - Funds tend to move in “Herds”.

## NATURAL GAS NON-COMMERCIAL (LARGE SPEC) TRADERS

OPEN INTEREST AND SPOT CONTRACT PRICE



SOURCE: CFTC & NYMEX

NOTE: 9/11/01 ESTIMATED

# Volatility Factors

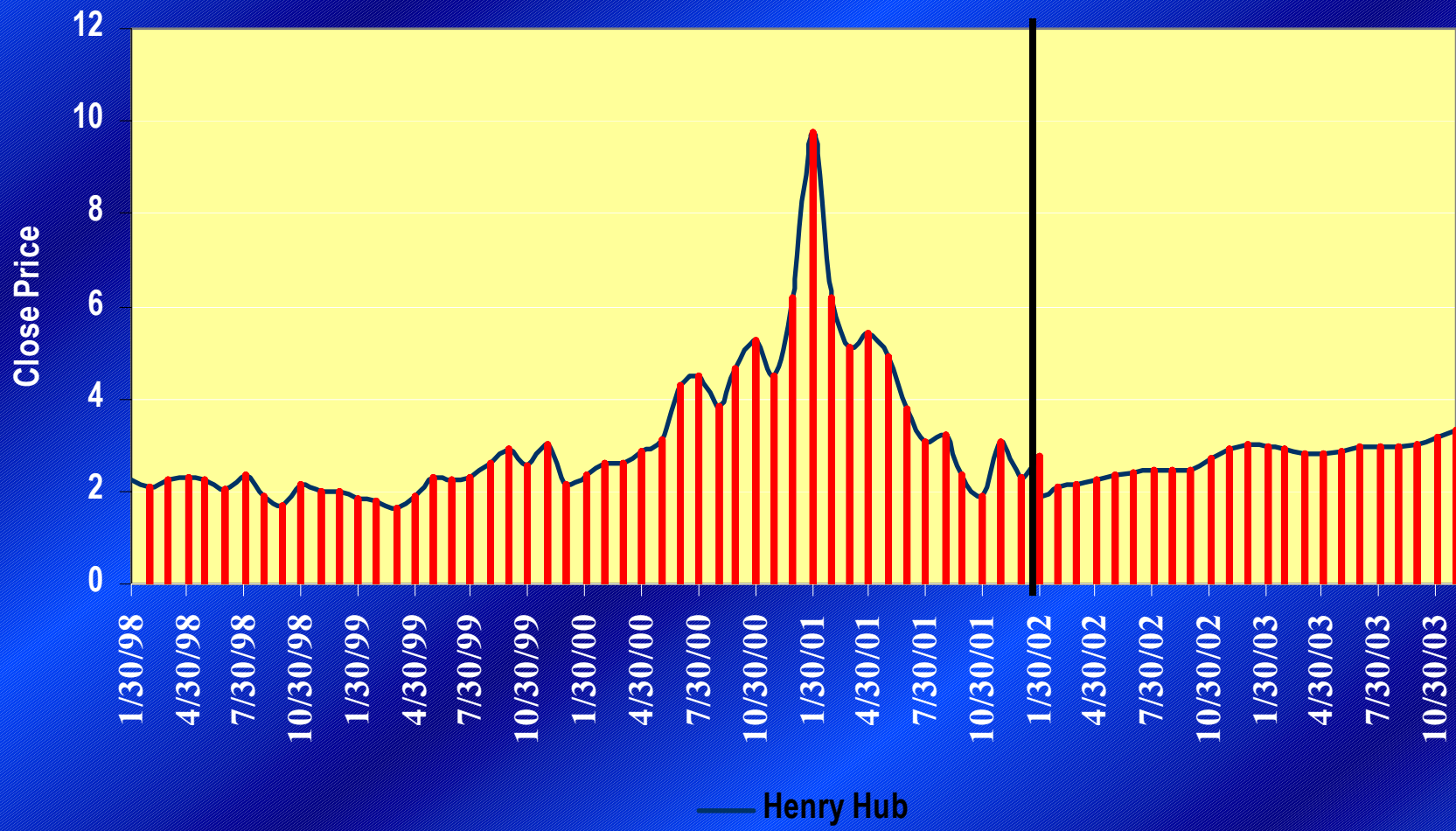
- Nationwide, the production decline rate is estimated to be over 27% in 2000, up from only 14% in 1990. The average 2000 U.S. natural gas production was 52.19 Bcf/d. 14.1 Bcf/d of new production must be located to maintain the current level of production.
- If nuclear generation is retired for safety or lack of waste storage, natural gas peaking plants will be the quickest solution to bridge the power generation gap.
- Enron= Capital Constraints.
- Constrained infrastructure will cause greater volatility.

# Capital Expenditure Cuts

<u>Company</u>	<u>Cut</u>
• Williams	\$ 1 billion
• Calpine	\$ 2 billion
• Dynegy	\$ .75 billion
• El Paso	\$ 1.5 billion
• Mirant	\$ 1.5 billion
• Enron	Bankrupt
TOTAL	\$ 6.75 billion

# Henry Hub

(1-31-02)





# Forecasts

- **EIA.Doe Annual Energy Outlook 2002 with projections to 2020**
  - “From 1995 to 2000 wellhead price on natural gas averaged \$2.38 per MMBtu (2000 dollars). Relative to that average, the price is expected to increase to an average rate of 1.6 percent per year in the reference case, reaching \$3.26 in 2020. In the low and high economic growth cases, the wellhead natural gas price is projected to increase at average annual rates of 1.1 percent and 2.2 percent, respectively, to \$2.94 per MMBtu in 2020 in the low growth case and \$3.65 per MMBtu in the high growth case”.
- **Spears Research**
  - “Though the 2002 downturn is steep given the heights of 2001, it will still be better than most of the “Nineties”. Now is the time to train people in preparation for the next upturn in November 2002.”
- **Salomon Smith Barney**
  - “Our 2002 composite spot natural gas price forecast of \$2.25/MMBtu is broken out as follows: Q1: \$2.25/MMBtu; Q2: \$2.00/MMBtu; Q3: \$2.25/MMBtu; Q4: \$2.50/MMBtu.”
  - “We continue to believe that if the temperatures this winter match the ten-year average, then composite spot natural gas prices will average \$2.25-2.50/MMBtu. If temperatures for the remainder of winter, on average, were to match the ten-year average, then composite spot natural gas prices in 2002 should average around \$2.00-2.25/MMBtu.”
  - “Beyond 2002 we believe that composite spot natural gas prices are likely to average above \$3.00/MMBtu for several years given the tightening supply/demand balance in North America.”

# Price Forecast

## ➤ 2002 Prices

The current market bottomed out back in late January at a contract low of \$1.85. The Funds were approximately 65,000 contracts short at this time and represented significant buying potential once they stated to cover. The physical buyers then entered the market providing additional strength to the up trend. The current price level seems to be supported by a combination of continued buying by the Funds and a cash market driven by weather and improving economy.

## ➤ Short Term View

Producers who have hedged gas will keep prices above \$3.00. In the next 2 months I can see this market testing the \$4.00 level. There is an element of fear embedded into the market. Assuming the expected demand for storage to be low and an El Nino weather scenario would reduce overall demand for air conditioning load in the South and California, I am expecting the market to soften and possibly test the \$2.30 level by October.

## **Price Forecast (con't)**

### **➤ Next Heating Season**

Assuming that the El Nino scenario develops, I would expect storage to be full and a mild winter, which would be conditions for a bearish market.

### **➤ Potential Fundamental Impacts**

- **El Nino**
- **Drilling Activity**
- **Economy**
- **Storage levels**

### **➤ Wild Cards**

**War / Terrorism**